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ABSTRACT

THE PROJECT HAD TWO ASPECTS: (1) DEMONSTRATION CLASSES WHICH WERE DESIGNED TO INFORM PARTICIPANTS ABOUT MADISON PROJECT MATH, AND (2) TRAINING WORKSHOPS THAT PROVIDED FOR DIFFUSION OF MATERIALS INTO SCHOOLS. ALTOGETHER 214 LOCAL TEACHERS AND PRINCIPALS TOOK PART IN THE WORKSHOPS RELATED TO MADISON PROJECT MATHEMATICS. EVALUATION OF THE PROGRAM'S EFFECT ON TEACHERS WAS DONE BY ADMINISTERING A QUESTIONNAIRE. PARTICIPANTS GAVE A VERY FAVORABLE RESPONSE TO THE PROGRAM. NO EVALUATION WAS DONE ON THE EFFECT OF THE PROGRAM ON CHILDREN. THIS WORK WAS PREPARED UNDER AN ESEA TITLE III CONTRACT. (BR)

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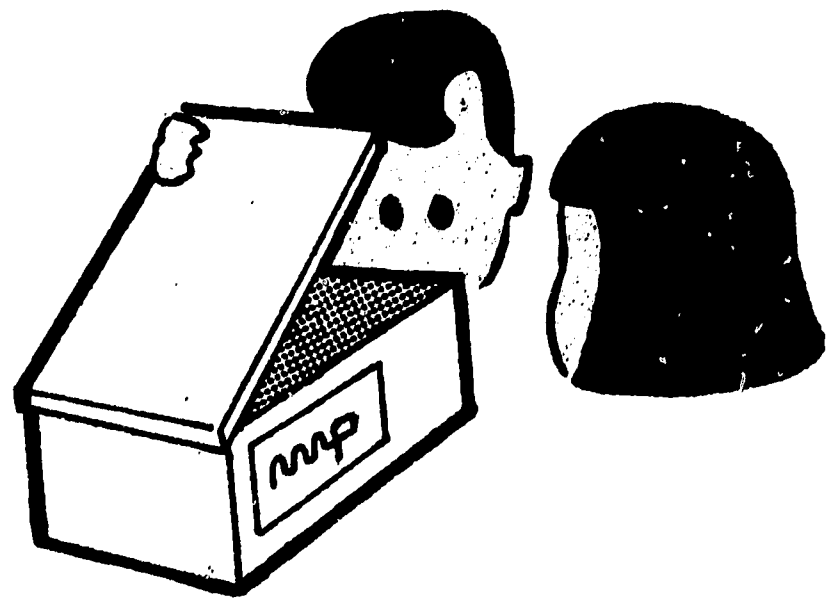

MADISON PROJECT

SUMMATIVE

EVALUATION

REPORT

the Elk Grove Training and Development Center
E.S.E.A. TITLE III
1706 West Algonquin Rd., Arlington Heights, Ill. 60005

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Gloria Kinney, Director

This report is dedicated to Wes Many, my evaluator. Without his support and help this report probably would not have been written.

I would like to acknowledge Mrs. Catherine Ekkebus, my secretary. It was certainly her diligent help in careful planning and meticulous execution of all phases of the program that kept the program viable.

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OVERVIEW OF THE PROGRAM

MADISON PROJECT MATH

The Madison Project Math model program offered the following services: Demonstration, Training, Consulting.

Demonstration

During the first spring semester of the T & D's operation, the demonstration was manned by Doris Machtinger and Phyllis Ferrell at Juliette Low School, District #59. It consisted of a brief orientation program followed by a demonstration of Doris Machtinger working with Kindergarten and 2nd Grade, then Phyllis Ferrell working with 4th Grade, then either Doris Machtinger or Phyllis Ferrell working with 5th Grade. This marathon of math classes was followed by a brief question and answer period. Demonstrations were held, by appointment, Tuesday and Thursday mornings.

During the following school year demonstrations were manned by Doris Machtinger and Judy Lowe at Juliette Low School, District #59. The orientation period was extended to include a description of the program followed by the opportunity to experience the independent exploration materials. The visitors then observed a class taught by Judy Lowe. This class lasted 20 to 30 minutes. This was followed by a question and answer period. Demonstrations were held every Tuesday and Thursday morning by appointment.

During the third operational year demonstrations were held by Mickey Palac at Fairview School, Schaumburg, District #54. Miss Palac was provided with a half-day substitute once a week to allow her to be with visitors. She held an orientation session with the visitors

describing the program and allowed them to experience the independent exploration materials, then demonstrated with her own class for 20 to 40 minutes. This class presentation was followed by a question and answer period. Visitors were given a booklet describing the Madison Project, a list of sources for materials and a sample of one of the more popular pieces of equipment, the geoboard. Demonstrations were held every Thursday morning by appointment.

Many different variations of workshops were offered. (Asterisks indicate that leaders were trained in T & D Madison Project Math Workshops lead by Doris Machtinger.

The Evolution of the Training Program

Workshop I

The first Madison Project workshop was held in the spring of 1967. It was conducted by Doris Machtinger and Phyllis Ferrell on 10 consecutive Tuesday afternoons. Released time was provided for the teachers involved. This first group of teachers were all from Juliette Low School, District #59, and served as a pilot group.

The workshop leaders presented Madison Project lessons to the teachers. One teacher out of the group then taught a lesson, not necessarily a Madison Project lesson to a small group of students. Using the Flanders interaction analysis and video tape, the group then attempted to critique this lesson.

Workshop II

The second Madison Project workshop overlapped the first, but met on Thursday afternoons. Most of its participants were from District #59 and District #25. This second workshop followed the first in format. This workshop was also held at Juliette Low School.

*Workshop III

The third workshop was conducted for four weeks during the summer of 1967 at Robert Frost School, District #59. This workshop was conducted mainly by Doris Machtinger and Judy Low with some assistance from Phyllis Ferrell. This workshop followed a new format. The Madison Project materials were presented to the teachers. They then broke into 4 groups of 4. One member of each group taught a half-hour lesson to about 5 to 7 children. The groups of 4 then combined with another group of 4 and the 8 discussed and compared the lessons.

Additional information, beyond observation, was provided by the Flanders interaction analysis and a tool designed by the group to analyze questions.

This workshop served 16 people from Districts #59, #25, and the parochial schools. The afternoon sessions of this workshop were divided between work on a special project and an attempt at some small group interaction conducted by Beecham Robinson.

Workshop IV

The fourth workshop was conducted in the fall and winter of 1967-68 by Doris Machtinger on released time on 10 consecutive Monday mornings at John Jay School, District #59. In this workshop a similar format to the above was followed with an exception being that teachers were grouped for teaching sessions with others who taught the same grade level. The workshop had 22 participants from Districts #59, #25, #15, DeKalb and Evanston.

Workshop V

The fifth Madison Project workshop was conducted during the spring of 1968. It was held at John Jay School in District #59 by Doris

Machtinger on released time for 2 weeks (10 full days). The 16 participants were from Districts #25, #57, #54, and #21.

The format was changed. The materials were presented to the teachers, who, in groups of 4, as in the summer workshop, presented the materials to small groups of students. Each group of 4 critiqued its own lesson. Two teaching sessions were provided so that 2 teachers in each group of 4 were able to teach each day. Openness in these groups was facilitated by the inclusion of 1-1/2 hours of group dynamics materials designed to encourage an awareness in each individual of the process in his group and his own unique contribution and pattern of behavior. These materials included:

1. Xerox listening course
2. SRA Teaching Lab
3. Process observation trio
4. Morton's article on leveling
5. NASA Moon game
6. Tinker toy motivation game
7. Especially designed tapes illustrative of adult workshop problems

*Workshop VI

This workshop was conducted for 10 half-days in DeKalb during the spring of 1968. The leader was Miriam Gulesarian. Group dynamics and video taping were included along with the Madison Project Math lessons and practice teaching. There were 10 participants.

*Workshop VII

This workshop was conducted for 5 full days by Bernice Gliege in District #25. There were 8 participants. This workshop also employed the format of presentation of material followed by practice teaching

sessions.

Workshop VIII

The eighth workshop was conducted during the summer of 1968. This workshop had two phases:

Phase A - Phase A was conducted by Doris Machtinger for 3 weeks at Rupley School, District #59 for 16 people and followed the same format as Workshop V.

*Phase B - Phase B consisted of 3 auxilliary workshops held for 2 weeks each concurrently with Phase A by personnel trained during Workshop V. Section (a) was held at Keller Jr. High School in Schaumburg, District #54 by Mickey Palac, John Kropp, Jessie Valerio, and Rosalyn Heftner for 40 people. Section (b) was conducted by Mrs. Jerry Garr at Miner Jr. High School in District #25 for 15 people. Section (c) was conducted by Mrs. Arlyle Ferguson and Miss Joy Lutsch at Lions School in District #57 for 16 people. In all three sections of Phase B the workshops were held in the afternoons. Materials were presented to the teachers and the format of teaching and critiquing was followed. When time permitted, a few of the group dynamics games were introduced.

Workshop IX

The ninth Madison Project workshop was held October 2 - 11 for 16 people at Clearmong School, District #59. The participants were from Districts #54, #59, #25, #65, and #21. The workshop met from 9 to 4 each day on released time. The format was similar to the one followed during the summer. Materials were presented to the teachers. They broke into teaching groups of 4 and taught the lessons to a small group of children. They divided each of 2 half-hour teaching sessions per

day into 15 minute sessions so that one teacher could concentrate on one lesson and so that each teacher taught every day. Time was allowed for group dynamics materials and for independent exploration materials.

*Workshop X

The tenth Madison Project workshop was held by Mrs. Jerry Garr in District #25 at North School. The 12 participants in this workshop came from Districts #25, #15, #65, and #23. This workshop followed much the same format as Workshop IX.

*Workshop XI

Workshop eleven was conducted by Mrs. Peg Aiman at Sandburg School in Wheeling for 10 teachers from Wheeling School District #21. It met November 18, 19, 20, 25, and 26 for 1-1/2 hours after school for the teachers involved but during class hours (because of split shifts) at the school housing the workshop. Thus children were available for the teaching sessions. The last session of the workshop was conducted for 1/2 day on released time to permit time to consider independent exploration materials and view a film besides the usual agenda. The workshop was followed by a visit to each of the teacher's classrooms by Peg Aiman to facilitate implementation of the materials. Mrs. Aiman was supplied released time for this.

*Workshop XII

The twelfth workshop was conducted December 2 - 6 by Carl Seltzer from District #54. The meetings were held on released time from 9 to 4 each day at Dooley School in Schaumburg School District #54. The 16 participants came from Districts #54, #65, #39, and #57. The workshop also followed the format of Workshop IX.

*Workshop XIII

This workshop was conducted on Monday afternoons in the form of

an in-service course in Mount Prospect. It lasted 10 weeks, of 1-hour sessions, and was conducted by Arlyle Ferguson and Joy Lutsch for 10 teachers from Mount Prospect.

*Workshop XIV

This workshop of 8 sessions was conducted in Evanston, half on released time, half after school, by Pat Kean and Sara Weinstein. The workshop had 15 participants and consisted of materials presentation, demonstration classes, and discussion.

Consulting Services

The consulting services were customized to the individual needs of the consumer. They varied from making a presentation at a teachers meeting to helping a teacher get the materials started in her class, to helping a math consultant set up a workshop. The Program Coordinator talked to workshop participants on the phone to try to diagnose problems in the lessons and made "house calls" if a phone diagnosis didn't work. The Coordinator was also available to do one-day workshops.

Released Time

Released time has been used for 3 purposes:

1. To release teachers to participate in the workshops. The bulk of the released time money was used for this purpose.
2. To release the demonstration assistant so that she can spend time with visitors.
3. To release workshop participants who were going to conduct their own workshops, first for planning, then to actually conduct the workshop.

Staffing

The following people have staffed this program:

Model Program Coordinator: Doris Machtinger

Secretary: Catherine Ekkebus

Others: During the first semester of the program Phyllis Ferrell served as co-coordinator.

Demonstration Assistants: Fall 1967 - Spring 1968 - Judy Lowe

Fall 1968 - Spring 1969 - Michaelene Palac

Participants

The participants in the workshops were mainly elementary school teachers, but at least 4 districts sent their Math Consultants (Districts #54, #21, #25, and #65). One principal participated. Teachers came from the following Districts: #15, #21, #23, #25, #39, #54, #57, #59, #65, #428, Round Lake and both the Lutheran and Catholic Parochial Schools. (List of participants in Appendix)

Visitors

Visitors to the program were mainly principals, superintendents and math consultants, though often these were accompanied by a few classroom teachers. Visitors were mainly from the northern Illinois area, though some were from as far away as Equador. Most visitors were from elementary school districts, though a few were from colleges. The College of Education from Northern Illinois University sent students to see the demonstration. A list of visitors is on file.

Demonstration

The Model Program was demonstrated at Juliette Low School, Elk Grove School District #59 and Fairview School, Schaumburg School Dist.#54.

Facilities

The Coordinator and Secretary were housed at the Elk Grove Training and Development Center, 1706 W. Algonquin Road, Arlington Heights, Ill. Workshops were housed in schools in the participating districts.

RATIONALE

Background and History

History of the Model Program -- The Madison Project has been conducting workshops in large cities for about five years. These cities include New York, Chicago, Los Angeles and San Diego. The workshops have generally been run during the summer or on Saturdays. Demonstration classes were conducted by Project staff as examples of how it ought to be done.

Dissemination of the Project's materials was handled mainly through talks by Dr. Davis and films he had made. Interested people were welcome to visit Madison Project classes.

The Madison Project was written into the original proposal for the Elk Grove Training and Development Center. The first year the model program was coordinated by Doris Machtinger and Phyllis Ferrell. During this year, both taught classes at Juliette Low School which were identified as demonstration classes. These classes were open to visitation. Together they also taught two workshops on released time for all the teachers at Juliette Low School and also for interested teachers in districts belonging to the consortium. These workshops involved about twenty-five (25) people. During the summer a Madison Project workshop was set up for sixteen (16) teachers from various districts of the consortium.

Beginning with the Fall of 1967 Doris Machtinger was given full responsibility for coordinating the model program. Judith Lowe became the demonstration teacher. The demonstration aspect of the program is devoted entirely to dissemination of the fact that there is a program called Madison Project Math and that this program is worth adopting.

The training aspect of the model program provides a training program for diffusion of the materials into the schools. Both the demonstration and training programs are described above. There is much written about the ideal way to teach children and adults including opinions on the inter-relationship of needs and climates. The Madison Project has taken the position that generally learning of this kind of material takes place best where there is:

1. general parental and teacher agreement on goals
2. creative, flexible, well-educated teachers
3. a very flexible school administration that supports both teacher and student
4. a non-authoritarian atmosphere in classroom, school, community and in most of the homes
5. respect for children as people
6. general satisfaction of children's needs
7. mutual respect and affection among all people involved
8. a general atmosphere of maturity, flexibility, creativity and cooperation in the school and in the community.

Further, the Project has taken the position that learning, i.e., true incorporation and synthesis of information, is best accomplished where there is opportunity for discovery. When this opportunity exists, there is a chance for the materials themselves to be reinforcing rather than for reinforcement to depend on the pleasing of a teacher.

The Project also has taken the position that the student learns best when he is active rather than passive. Dr. Davis [1] sums up the Project's history and impact as follows:

History of the Project Itself -- The Project's earliest exploratory classroom work was done in the academic year 1957-8 at the Madison School in Syracuse, New York with low-I.Q. culturally-deprived 7th

graders, under the direction of Professor Robert Davis of Syracuse University, and Mrs. Jane Downing and Mr. William Bowin of the Syracuse Public Schools. These children had, in many cases, not yet learned elementary school arithmetic. Nontheless, it seemed inadvisable for many reasons to teach them remedial arithmetic; for example, they already disliked arithmetic, there was no reason to suppose that repetition of a teaching procedure that had failed in the past would lead to success in the future, these children badly needed success experiences and a feeling of vitality and challenge in their school work, and arithmetic is, in any case and for any child, a rather isolated small piece of the wide world of mathematics. Hence, the children were taught portions of algebra and analytic geometry. Their response was favorable beyond expectation: they learned arithmetic (which was, of course, repeatedly required in the alebra and geometry), they learned algebra and geometry, they acquired a new enthusiasm for school (for example, truancy decreased markedly), and they seemed to have modified their personal self-concepts and aspiration levels. The instructional procedure was to use "individualized instruction" -- students either worked alone, or else in small groups, and the teachers divided their attention among the groups and individual students. At no time did the teachers attempt to address the entire class as a total group. This year might be described as an attempt by Project personnel to convince themselves that significant improvement in the curriculum was possible.

1958-9. Because of the preceding year's success with low-I.Q. culturally-deprived seventh-graders, the Project sought to explore the potential for curriculum improvement with normal seventh-graders, and with normal and bright fourth-graders. Exploratory teaching during

1958-9 focussed on these groups, in middle class neighborhoods. Unfortunately, at this point the Project's previous use of individualized instruction was lost, and was replaced by teaching via working with the entire class as a total group. The reason for this was primarily the involvement of new teachers, not accustomed to individualized or small-group instruction. The procedure of working with the total class as a single group remained normal Project practice until 1963, when various Project advisors (especially Leonard Sealey of Leicestershire, England) reopened this issue. The year 1958-9 began the Project's concern for elementary school children, and for normal (or even bright) children.

1959-62. In 1959 the geographical focus of Project work shifted from upstate New York to Connecticut, and Mrs. Beryl S. Cochran of the Weston, Connecticut Public Schools became the dominant influence on the Project's exploratory teaching. The Project's efforts acquired, thereby, some new emphases, which characterized most Project work for the next few years:

i) Teaching to the entire class as a single group

ii) Preferences for homogeneous grouping within a school

iii) Emphasis on working with top groups, in grades 2 through 6

iv) Following the same children for as many years as possible (usually about 5 years)

v) Use of visiting specialist teacher for mathematics, to work with the regular classroom teacher

vi) Emphasis on demonstrating that bright children in grades 2 through 6 could learn a very large amount of sophisticated mathematics (even completing large sections of high school and college-level mathematics)

vii) Extensive study of how these children learned so much, with particular emphasis on creativity and discovery.

The Project's exploratory teaching of this period involved the most sophisticated mathematical content, and the greatest emphasis on creativity, that the Project had ever experienced, and -- for grades 3 through 7 -- these lessons are probably still the most "advanced" (in these senses) that have been taught by any project thus far. The lesson learned here -- and recorded on film, audio tape, and in other ways -- that bright children in grades 2 through 7 can learn a very large amount of mathematics in a creative way, and enjoy doing it (in fact, enjoy it immensely), ought not to be forgotten. The Madison Project has subsequently de-emphasized this aspect, because of the very great difficulty of locating teachers who can teach such classes, but the fact remains: Much of the mathematics nowadays learned in high school and in college can be learned easily by bright elementary school children in grades 2 through 6, and the children can enjoy it very much. At some time our society must pay heed to this unused potential -- particularly in view of the fact that such mathematical experiences are viewed by the children as exciting and pleasurable, not as unpleasant.

These "advanced" classes (especially at Weston, Connecticut) have been studied by Psychoanalytically-trained psychiatrists (C. Brooks Fry, M.D., and Carol Fry, M.C.), who have emphasized the children's great eagerness and their unusual absence of anxiety; they have been studied from the point of view of the children's own perceptions and preferences by the clinical psychologist Herbert Barrett; and they have been studied from the point of view of objective measures of mathematical achievement by J. Robert Cleary, of Educational Testing Service.

But perhaps most of all the growth of these children over a period of 5 years has been recorded in detail on film, video tape, and audio tape. One can observe how these children approach problems in mathematics and mathematical physics. Their power and their enthusiasm are impressive.

For these "advanced" classes, it is worth adding that "bright" children means approximately the top third of the entire student population in suburban communities such as Weston, Connecticut; the over-all average I.Q. for these "advanced" classes is about 120, but this point should not be pursued in detail since I.Q. does not seem to play an especailly decisive role in the achievement of these students. It should not be over-emphasized.

It <u>is</u> worth emphasizing, however, that attempts to replicate these results in other schools have not always succeeded. There is apparently some combination of attributes in certain schools that makes it possible to succeed in these schools in a way that is not possible in general. The Madison Project has not succeeded in identibying the attributes of a school that make such "advanced" classes possible, and this is probably one of the Project's most regrettable failures.

Project personnel and consultants <u>believe</u> that the attributes necessary for success probably include:

i) General Parental and teacher agreement on the desirability of these goals, and on over-all educational goals in general

ii) Creative, flexible, well-educated teachers

iii) A very flexible school administration and school organization, that supports both teacher and student in every possible way

iv) A non-authoritarian atmosphere, in the class, in the school, in the community, and in most of the homes

v) Respect for children as people

vi) General satisfaction of children's needs, including needs for physical activity, affection, attention, autonomy, etc.

vii) Mutual respect, and even affection, among all the people involved: parents, teachers, children, and administrators

viii) A general atmosphere of maturity, flexibility, creativity, and cooperation in the school and in the community

The identification of necessary attributes is elusive. Nonetheless, the fact remains, in some schools, but not in others, it is possible for "bright" elementary school children to learn a large amount of high school and college mathematics, in a creative way, and enjoy doing it.

No one who witnessed the Weston classes can escape from the feeling that this fact must be important.

1961-present. In 1961 the Project opened a third office, at Webster College, In Webster Groves, Missouri.

At the present time the Project has three offices: at Syracuse University, Syracuse, New York; at Weston, Connecticut; and at Webster College. Since 1961 the Project has cooperated in a variety of teacher training programs at Webster College, to the extent that new emphases have appeared in Project work:

i) The major emphasis has been on teacher education, both pre-service (college undergraduate) and in-service

ii) In terms of student selection, the Project began in 1961 working primarily with "ordinary" college-bound students, in "ordinary" school situations, but still with considerable

emphasis (wherever possible) on the use of specialist mathematics teachers for the intermediate grades.

iii). The Project began to be concerned with larger numbers of teachers and larger numbers of students, spread geographically over much of the United States (and even in Canada, Australia, England, and Africa).

iv) As a result of the preceding emphases, the Project began to distinguish more sharply between tentative, exploratory lesson sequences, and reliably-tested stable lesson sequences. Only the latter were used in large-scale teacher education work.

v) The Project had a number of unsatisfactory experiences in attempting to work with junior high school students (grades 7 and 8). Students at this grade level pose especially difficult problems for curriculum planning; this has been, in general, the experience of a large number of curriculum projects. Probably much more study of children of this age is needed, together with a far greater effort to use the results of such studies in designing school programs, and in allocating grades among the various buildings (e.g., 8-4, or 6-6, or 4-4-4, or 6-3-3, etc.).

1963-present. Beginning in 1963, several new emphases appeared:

i) The students whom the Project follows for 3, 4, or 5 consecutive years were, of course, getting older and moving into later grades. Largely as a result of this, together with unresolved doubts about the program for grades 7 and 8, the Project began to focus considerable effort on grade 9.

ii) At the other end of the age scale, the Project reviewed its exploratory teaching in nursery school, kindergarten, and grades 1 and 2 -- which had until then been desultory and disorganized -- and began a concerted systematic attack on exploratory teaching of mathematics at this grade level.

Perhaps most important are the following returns to earlier directions:

iii) The Project began large-scale work with culturally-deprived urban children, in St. Louis and in Chicago, with unexpectedly gratifying results.

iv) The Project, stimulated in part by Leonard Sealey of Leicestershire, England, has renewed its original interest in individualized instruction and in the procedure of dividing a class of (say) 30 students up into "committees" or "small groups" of about 3 or 4 each. In either case, the teacher seldom if ever stands at the front of the room and addresses the entire class. Instead, the teacher sits with one group for a while, then moves on to another, etc.

Finally, as a result of the desire to let students work alone or in small groups, of the desire to combine some mathematics with some physical science, and of the desire to reach "non-verbal" children whose ability may be great but who do not function naturally in a world of verbal behavior and abstractions, the Project has acquired another emphasis:

v) The Project has given new impetus to its effort to produce "individualized study materials," in the form of a library of "shoe-box" kits for various scientific experiments, mathematical puzzles, etc.

PURPOSE

Basic beliefs underlying the philosophy of the Madison Project are the following:

1. There is a need to broaden and expand the scope of the existing math programs to incorporate more areas of math than usually found in the arithmetic programs. The Madison Project materials will broaden that base.
2. The traditional teaching of math has tended to focus more on students' failures and weaknesses than their successes. Thus children lack all important success experience. The Madison Project materials will provide the success experiences necessary for learning and a general good attitude toward math.

The Madison Project model program provided the following promises. for educational change:

1. By providing teachers a chance to be exposed to this material and helping them use it in their classroom, we are beginning to induce a change on the curriculum in mathematics.
2. By providing training for teachers on a released time basis we are asserting that continued education is an essential part of today's teaching and should be included in, not added to the existing work load.
3. By emphasizing the assisting role for the teacher in place of the directive instructing role, we are making a subtle change in the whole social climate of the classroom directed at making school a more human place and pleasure rather than a chore. This change will be essential considering the trend for students to spend more and more of their life in school.

The objectives of the model program, as originally formulated, were divided into two categories, demonstration and training. The behavioral objectives of the demonstration were:

1. Visitors to the program would talk to collegues about their experience.
2. Visitors would order the Madison Project materials.
3. Visitors would provide a source of people for workshops

The behavioral objectives of the training program were:

1. Teachers would be able to perform specific Madison Project skills.
2. Teachers would be able to teach the Madison Project materials.
3. Teachers would teach Madison Project materials in their classroom.
4. Teachers would transfer the relaxed, discovery type low pressure technique inherent in the Madison Project lessons to other subjects.
5. Teachers would open their classes to their collegues.
6. Teachers would merge Madison Project lessons with regular work.

The objectives of the training program stayed the same throughout the three years, but the objectives of the demonstration program shifted. The demonstration program served as a service to the Northern Illinois area to provide an opportunity for the community to see an operating model of a Madison Project program. It's objectives were to publicize the existance of the program and deploy its materials, not to get participants in the workshops.

Relation of the Model Program to the Basic Questions of T & D

A major portion of the training program was devoted to encouraging participants to expose and study, openly and objectively, their own behavior. Ass Madison Project lessons were "practiced" by each teacher with the aid and support of three other teachers. These "practice" lessons were critiqued, often with the aid of the Flander's Interaction

Analysis Scale and audio and video tape. Further, teachers in the program were encouraged to demonstrate the new materials with their collegues and discuss with them their new techniques.

The whole format of the Madison Project materials is such as to imply a change in teacher role. These materials are discovery materials and not conducive to the traditional paradign of: Information ⟶ to teacher ⟶ to student ⟶ back to teacher. The materials are information laden, the teacher serving only as a catalyst for student-material interaction.

The specific skills teachers learned in the Madison Project program are:

Pebbles in the bag

Postman stories

Tic-tac-toe

Graphing lesson: □ + △ = 12

Graphing lesson: 3 x □ + 1 = △

Guess the function

Quadratic equation lesson

Area with geoboards

Area equation on graph

Tin Foil geometry

The effects of the program on students is both obvious and subtle. Obviously the students will have mastered those skills which their teachers present to them, hopefully the same ones mentioned above.

More subtle is the question of attitude and transfer of learning. It is hoped that their attitude toward math will become more optimistic, that when they are faced with a mathematical problem, they will assume

they can solve it rather than that they will fail. It is also hoped that they will begin seeing math as a tool to help shine light upon other disciplines. Lastly, it is hoped that they will love math for its own intrinsically captivating self -- derive pleasure from the discipline in the abstract without additional rewards.

ACTIVITIES

Demonstration

During the three years of demonstrating the Madison Project Math materials for the Elk Grove Training and Development Center the following activities were used:

1. Orientation
2. Observation
3. Participation
4. Discussion

The initial orientation was a very brief, sketchy description of the Madison Project Math materials. The interest of the participants encouraged us to extend this to a very detailed description of the history of the program and its materials. The initial demonstrations had a long observation period in which the visitors watched as many as five half-hour classes. Their apparent boredom, indicated by glassy eyes and frequent yawning, encouraged us to shorten this observation period to one twenty-minute session. This proved to be long enough to give credibility to the claims made about the materials during the orientation.

Initially there was no opportunity for participation since most of the time was being spent on observation of demonstration classes. We noticed during the brief orientation period that our visitors were hesitant to put down the manipulative material and often made us late to the demonstration classes. When we changed format we made this experience with the manipulatives an integral part of the demonstration program.

Under the original format our visitors were so tuckered out after hours of observation that they had very little to say. Under the latter format, after hearing about the Madison Project Math, seeing it demonstrated and experiencing the materials, the visitors were eager to react to what they had seen and experienced. They were encouraged to consider the implications of the material in their home setting as well as its implications generally.

Training

The following activities were used in the training programs of Madison Project Math:

Presentation

Independent manipulation of materials

Independent study

Micro-teaching

Critiquing

Group dynamics games

Xerox listening course

Simulation materials (SRA)

The Madison Project Math materials were presented to the teachers in the same way as they would be presented to the students. The teachers then practice-taught these materials before a group of their peers using a small group of students. These lessons were then critiqued by the teachers. Each teacher had the chance to teach four or five times during each workshop. This gave the workshop leader a chance to help the teachers clear up areas in the presentation that may have been hazy and gave the teachers a chance to try out the new materials with help and guidance before they went back to their own classrooms. During all the workshops

teachers had the chance to manipulate the independent exploration material for themselves, following the included instructions so that they would know what the students were going to experience. In two of the workshops time was provided for the teachers to pursue interesting projects in depth themselves with the workshop leader serving as a resource person.

In some of the workshops group dynamic games, such as the NASA game, tinker toys motivation game, and the trio process observation were used. These were used mainly to expose participants to situations in which they were forced to notice their own behavior patterns. It was hoped that they could perhaps relate their behavior in those groups to their effect on children. It was also hoped that they would develop a deeper, more trusting relationship with the teachers in their critique groups, thus making the critique experience more real and more in depth.

In two workshops the Xerox listening materials were presented. The pre and post tests included with this showed a 100% improvement for everyone but we questioned its transfer value when not listening to Xerox listening tapes.

The SRA simulation materials were used in most of the workshops. These were used mainly to get teachers to start talking to one another on how they handle problems in their own classrooms. This opened up discussion on goals, appropriateness of goals and in general provided teachers with a chance to re-evaluate their own basic values and beliefs in education.

Dissemination

The activity most often used to disseminate Madison Project Math program was a personal visit to the superintendent to describe the materials.

and see if the district would be interested. Occasionally a presentation was made to an administrators' meeting, or a group of teachers on Institute Day.

Other Activities

During the three years of the program three large group meetings were held. These were held to provide teachers the apportunity to hear "great" men and their ideas. The first of these meetings featured author John Holt, the second, the Director of the Madison Project, Dr. Robert B. Davis and the last, author Niel Postman.

Techniques

It is difficult to separate activities from techniques. I have designated the things the participants did as activities; the things the Model Program Coordinator did were techniques. The techniques used in demonstration were quite elementary. The demonstrator listened and tried to ascertain the visitors objectives in being there, then responded accordingly.

During the training sessions the techniques used included various degrees of lecture, personal experience and confrontation. The most interesting technique developed was the micro-teaching. For this technique, modified from its form as conceived by Dwight Allen at Stanford University, teachers were divided into groups of four. One member of the group presented a concept to four or five students while the others watched. If the teacher doing the presenting got into trouble the other teachers helped out. (The mood was kept very informal.) The other three teachers in the group watched the presentation, often did a Flander's interaction analysis on the lesson, an analysis of questions asked and kept record of anything else the group felt was of interest.

After the lesson the group critiqued the lesson, concentrating on the method of presenting the new materials and the interaction with the children. A suggested list of questions for discussion is included in Appendix B.

EVALUATION

Formative Evaluation

The formative evaluation process of the Madison Project Math was basically twofold. First, data was gathered from each workshop participant and second, visitors to the demonstration school were asked to complete an evaluative form.

The evaluation procedure for the workshops initially consisted of a content and process test and subjective comments pertaining to specific asked items. This data, particularly the mathematics skills test for the participants, was deemed of little value for it failed to provide pertinent information to the stated objectives. Accordingly, the procedures were changed. Throughout the program different techniques were tried. The last of the formative evaluation consisted of pre and post measures of participant competencies for each of the Madison Project Math lessons, a "This I Believe" measure affording each participant an opportunity to express philosophical beliefs concerning the teaching of mathematics and a general comments statement from which reaction to each workshop was determined (See Appendix C for forms).

Other evaluative techniques were employed during certain of the workshops in an effort to gain different formative data. These techniques included a pre and post measure of a derivation of the "Draw-A-Man" test and pre and post workshop audio tape analysis. The modified "Draw-A-Man" was used in an effort to determine any modification of the teacher's perception of his relationship with students as a result of the workshop. This technique was perhaps the most meaningful of all techniques tried, but was discontinued because it was too expensive. The audio tape analysis was employed to ascertain any major changes in teacher classroom verbal behavior after completion of the Madison Project Math Workshop.

The feedback from the formative data was analyzed for each workshop. One of the major changes introduced early in the program as a result of this data was the inclusion of children as an integral part of the learning experience of workshop participants. After presenting the teacher participants with specific lessons, the teachers had an opportunity to immediately try them with children. This practice enabled them to ascertain the specific aspects of the lesson that needed strengthening or to clarify any questions that arose as a result of actually teaching the lesson to a group of students.

Early results indicated that the optimal group size was 16, so an attempt was made to keep workshop enrollment around this number.

There was no question but that the most productive use of time resulted in the workshop that met everyday as opposed to once a week. After Fall, 1967, therefore all workshops were conducted on this basis.

Indications from the formative data were that a catalyst was necessary to promote "groupness" and group dynamics games were incorporated into the workshops after Fall, 1967.

Requests for Madison Project Math workshops were so numerous that the Model Program Coordinator could not fill the demand. Beginning in Spring, 1968 an effort was made to train some people to be able to conduct their own workshops. At least 7 Madison Project Math workshops have been conducted by those trainees.

The major summative evaluation focus has been upon the training of workshop participants. A follow-up questionnaire was mailed to 154 participants. Responses were received from 120 or 78%.

The information gathered pertained to the following basic questions related to the attainment of the basic program objectives:

1) the extent to which participants actually have or have not employed

the Madison Project Mathematics activities in their classrooms.

2) possible reasons for not using the activities

3) the extent of student understanding of each activity

4) degree of confidence expressed by each participant toward his ability to teach the Madison Project Math activities

5) the extent to which teachers who have not attended a workshop have evidenced an interest in attending such a program

6) the extent to which workshop participants have discussed Madison Project Mathematics with other teachers about the program

7) the extent to which Madison Project Mathematics materials have either been purchased or constructed by schools

8) the attitude of workshop participants toward the adequacy of their personal mathematics preparation for the program

9) a general rating of the value of the workshops of the participants

Operations

A total of 214 teachers and administrators participated in the Madison Project Math workshops. Complete list is on file.

A total of 264 educators visited the demonstration sessions. This list is also on file.

Various means were used to collect data. They included:

1) Summative questionnaire (Nov., 1968)

2) Formative Questionnaire (post test, all workshops)

3) Content & Pedagogy Test (post test - 1 workshop)

4) Draw-A-Man test (pre & post test -- 2 workshops)

5) This I Believe test (pre & post test -- 2 workshops)

6) Audio tapes (pre & post -- 1 workshop)

7) Brickbats & bouquets (every second day -- all workshops)

The forms are compiled in Appendix

Treatment of Data

1) Content analysis was applied to the "This I Believe" data in an effort to ascertain changes of beliefs toward the teaching of mathematics

2) Chi-square analysis was applied to the formative questionnaire to determine changes in competencies to use the Madison Project Mathematics activities

3) The summative questionnaire, being descriptive in nature, was tabulated and cummulative results reported.

4) Content analysis was applied to the audio tapes in an effort to determine changes in the verbal behavior of the workshop participants

5) the pre and post measures of the modification of "Draw-A-Man" test were analyzed by a trained psychologist for observable alterations of behavior

Summary of Findings

The extent to which workshop participants have used the Madison Project Mathematics activities is reported in Table 1. The activity used most frequently was Tic-tac-toe (101) while the area equation on graph was used least (18).

Table 2 presents the opinion of the teacher participants regarding the understanding by their students of the various Madison Project Mathematics activities. As can readily be determined, the teachers were of the opinion that the activities were, by and large, very well or well understood. Few teachers indicated a poor understanding on the part of students while no teachers reported very poor understanding on the part of the students.

TABLE I

CHECK THE APPROPRIATE SPACES

1.	I have used	I have not used but intend to do so	I have not used and do not intend to do so because:			
			the grade level is inappropriate	I don't like the lesson	the materials are unavailable	other
Pebbles in the bag	80	13	22	1		2
Postman stories	83	25	6			2
Tic-tac-toe	101	11	3			2
Graphing lesson □+△ = 12	58	39	14			2
Graphing lesson 3×□+ 1 =△	44	38	27			2
Guess the function	84	20	9			
Quadratic equation lesson	22	40	42	2		4
Area with geoboards	62	38	11	1	2	2
Area equation on graph	18	50	30	3		5
Tin Foil geometry	22	59	16	15		6

TABLE 2

CHECK THE APPROPRIATE SPACES

11.	In my opinion most of the students understood these activities:				
	very well	well	poorly	very poorly	I did not use this
Pebbles in the bag	65	20			28
Postman stories	49	36	4		21
Tic-tac-toe	83	19			8
Graphing lesson $\square + \Delta = 12$	31	31	1		42
Graphing lesson $3 \times \square + 1 = \Delta$	18	27	2		57
Guess the function	50	31	3		24
Quadratic equation lesson	7	22	4		69
Area with geoboards	33	26	4		38
Area equation on graph	9	11	2		75
Tin foil geometry	9	10	2		79

Table 3 presents the responses of the teachers when asked about their ability to use the Madison Project Mathematics activities with the children. For no lesson do the insecure, very insecure responses out-number the very confident, confident indications. There is, however, considerable variance with regard to confidence in the ten different activities. It can be noted that the two activities which the teachers indicate to be the ones with which they are insecure are those which were listed as being used least frequently (quadratic equation lesson and area equation on graph).

The workshop participants were next asked whether or not they were aware of other teachers in their building who had not attended a Madison Project Mathematics workshop that wanted to use Madison Project Math. Of the 120 who responded to this question, 72 or 60% said "yes" and 44 or 36.6% replied "no". Four or 3% offered replies but did not respond either "yes" or "no" to the question.

The Madison Project workshop participants were next asked whether they had talked to teachers responsible for teaching mathematics in schools other than their own about Madison Project Mathematics. Eighty-two (68.3%) replied "yes" to the question while 38 (31.7%) responded "no".

Actual materials purchase or construction by the workshop participants was deemed to be rather good evidence of the degree of commitment to Madison Project Math. Table 4 displays this data.

The participants next were asked whether or not their math background was sufficient to enable them to participate effectively in the workshop. One hundred fifteen (95.8%) indicated that their mathematics background was sufficient whereas five (4.2%) replied that it was not.

In conclusion, the teachers were querried as to the overall value of the workshops to them. Sixty-one (53%) replied that the Madison Project Math workshops had been highly beneficial; fifty-three (46%)

TABLE 3

CHECK THE APPROPRIATE SPACES

III.

	How do you feel about your ability to use these activities with children?			
	very confident	confident	insecure	very insecure
Pebbles in the bag	84	27		
Postman stories	81	33	1	
Tic-tac-toe	100	16	1	
Graphing lesson $\square + \triangle = 12$	57	46	8	1
Graphing lesson $3 \times \square + 1 = \triangle$	44	50	15	1
Guess the function	78	32	2	1
Quadratic equation lesson	24	46	25	9
Area with geoboards	54	43	14	3
Area equation on graph	25	45	25	9
Tin foil geometry	35	46	14	12

TABLE 4

Workshop Date	Number of Schools Participating	Number of Schools Making Some Purchase of Equipment
6/21 - 7/21/67	13	11
10/67 - 1/68	12	9
3/5 - 15/68	11	11
4/15 - 23/68	4	4
4/22 - 5/3/68	6	6
6/24 - 7/12/68	13	10
6/24 - 7/9/68	39	30
10/7 - 11/68	10	10

noted that it had been beneficial and one (1%) replied the workshop had been of little value to him.

In summary of the 154 workshop participants 120 responded to a questionnaire. The data appears to indicate favorable responses to the Madison Project Mathematics workshops. More specifically, the data suggests that Madison Project Mathematics has transferred from the workshops to the classroom where it is being used by the teachers: that children appear to understand the activities; that teachers are generally confident in their ability to teach the activities; that the participants have discussed Madison Project Mathematics with their colleagues; and that other teachers are desirous of training in Madison Project Math; that commitment to Madison Project Math is evidenced by the acquisition of necessary materials for teaching and finally that those who participated in the workshops were of the opinion that the program was beneficial to them.

The basic questions of the Elk Grove Training and Development Center are related to two basic concepts -- changing role perceptions and teacher behavior and the acquisition of specific skills by the participating professionals.

While Madison Project Mathematics was concerned with both of these facets, the one most readily measured was that dealing with skills acquisition. The gaining of additional requisite skills and techniques for the teaching of mathematics was a prime concern of the Madison Project Math workshops. The summative data suggests that these techniques and skills are being employed in the classrooms. Ultimately the impact of this instruction will be evidenced from the large numbers of children to be exposed to Madison Project Mathematics. If one multiplies the number of workshop participants by an average classroom size (30

pupils), some 6000 children will be effected by Madison Project Math per year. When this, in turn, is multiplied by the number of years teachers will be involved in the teaching of mathematics, the number of students that may be effected by the Madison Project Mathematics program becomes significantly large.

RECOMMENDATIONS

In writing recommendations, one is always torn between describing the unattainable ideal situation or the practical alternative that accomplishes the goals. On a practical level, the program ran fine. The demand for workshops was more than the budget allowed. Since I fully endorse the released time format, one recommendation would be either more money for released time or more matched funds from the districts for the same purpose.

The area of evaluation is one area that presents sticky problems. There is a need for more illuminating techniques in three areas. The main evaluation done has been called formative. However, in fact, this formative evaluation was really summative with respect to each workshop. There is a need to develop unobtrusive techniques to help a workshop leader make day-to-day decidions as well as make plans for the next workshop.

The technique used for the summative data relied entirely on answers to questionnaires. There is no data about "how well" a teacher teaches the lesson she reports she is teaching. Techniques need to be developed for this purpose.

Lastly, this program did not evaluate the effect of the program on the children. Minimally, attempts should have been made to demonstrate that the children's performance was not hindered by exposure to these materials. Once this pessimistic outlook was dispensed with, an attempt should have been made to show that children's performances were enhanced and their attitudes toward math improved. Tools to do these jobs also need to be developed.

I must point out that the Elk Grove Training and Development Center provided an excellent staff of supportive, compassionate co-workers. Administrators were always to be counted on for support if a problem came up.

REFERENCES

1. Davis, Robert B., A Modern Mathematics Program as it Pertains to the Interrelationship of Mathematical Content, Teaching Methods and Classroom Atmosphere. (The Madison Project) Cooperative Research Project No. D-093, of the Office of Education, U.S. Department of Health, Education and Welfare. Syracuse University - Webster College. 1965.

ABSTRACT

The Madison Project Mathematics is a program that was imported from outside the local area by the Elk Grove Training and Development Center. This math program is best described as supportive and supplementary. It assumes the content of the basic programs and takes this content one step further.

The Elk Grove Training and Development Center offered workshops and a demonstration program in the math project from January, 1967 through June, 1969. The Model Program Coordinator was Mrs. Doris Machtinger; Demonstration Assistants were Mrs. Judy Lowe and Miss Michaelene Palac; 264 educators visited the program; 214 teachers and principals took part in the workshops. The visitors came from all over the United States, Puerto Rico, Equador and other countries.

Workshop participants were mainly from the local area. However, Madison Project Math has been incorporated in the curriculum as a result of this program in such distant places as Charleston, Ill., Evanston, Ill., Wilmette, Ill., Fish Creek, Wis., Columbia, Neb., Corpus Christi, Texas, and Grand Forks, N.D. It is estimated that at least 6000 children a year will be exposed to Madison Project Math lessons as a result of this program. All the school districts cooperating made the minimal commitment of ordering the materials besides sending teachers to the workshops. The demand for Madison Project Mathematics is still high in this area. It is only regretful that funds are not available to continue this program.

APPENDIX A

Chronological Overview

WORKSHOP PARTICIPANTS

DATE	LEADER	NO. OF PARTICIPANTS	NO. OF SCHOOLS IN DIST.	
6/21-7/21/67	Doris Machtinger	16	7	#25
			5	#59
			2	Par.
10/67-1/68	Doris Machtinger	22	4	#15
			6	#25
			4	#59
			1	#65
			4	#428
3/4-15/68	Doris Machtinger	16	3	#21
			2	#25
			4	#54
			6	#57
4/15-18,23/68	Bernice Gliege	8	7	#25
4/22-5/3/68	Miriam Gulesarian	10	8	#428
6/24-7/12/68 (Leadership)	Doris Machtinger	16	2	#15
			1	#25
			1	#54
			2	#59
			2	#65
			1	#116
			7	Par.
6/24-7/9/68	Michalene Palac	71	6	#15
	Rosalyn Hefner		3	#21
	John Kropp		1	#23
	Jessie Valerio		6	#25
	Joy Lutsch		12	#54
	Arlyle Ferguson		4	#57
	Jerry Garr		5	#59
			2	#65
			7	Par.
			2	Wis.
10/7/-11/68	Doris Machtinger	16	1	#21
			4	#25
			4	#54
			1	#59
			2	#65
11/18-22/68	Jerry Garr	12	1	#15
			1	#23
			8	#25
			1	#65
11/18-26/68	Peg Aiman	10	7	#21
12/2-6/68	Carl Seltzer	15	2	#39
			7	#54
			1	#57
			3	#65

APPENDIX B

Syllabi Followed in the Workshop

E L K G R O V E T R A I N I N G & D E V E L O P M E N T C E N T E R

DISCUSSION GUIDE

Questions to be answered in group discussion by people observing the lesson.

1. What content was covered:

2. What techniques were used?

3. Which kids responded to which parts of the lesson?

4. Describe the behavior of each child.

5. Speculate on how much each child got out of the lesson.

6. Who enjoyed the lesson the most? Why?

7. Who seemed to enjoy the work the least? Why?

8. What problems arose?

9. How were they handled?

10. How else could they have been handled?

11. Will the problem be a problem for tomorrow's teacher?

12. How will it be handled then?

13. (For this lesson's teacher to answer) If you could do this lesson over again, what would you do differently?

14. What was the best part of this lesson that you will repeat if you can?

15. What is the lesson going to be tomorrow?

    a. Content

    b. Special action with respect to special problems.

DM/ce - 6/12/68

CALENDAR

JUNE	MONDAY, 24TH	TUESDAY, 25TH	WEDNESDAY, 26TH	THURSDAY, 27TH	FRIDAY, 28TH
		#25 - Cuisennaire Rod Film		#57 - Cuisennaire Rod Film	#25 - Davis Film
		#54 - Video Tape		#54 - Davis Film	
July	MONDAY, 1ST	TUESDAY, 2ND	WEDNESDAY, 3RD	MONDAY, 8TH	TUESDAY, 9TH
	#54 - S.R.A.		#54 - Cuisennaire Rod Film	#25 - S.R.A.	
	#25 - VIDEO TAPE		#57 - Video Tape		

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Dist. #25	Number line Tic-Tac-Toe Pebbles in the bag Pet Shop	Postman stories Addition & Subtraction	Postman stories Multiplication Open sentences	Guess the function Quadratic equation	Graph □ + △ = 9 Introduce 3 x □ + 4 = △
#54	Tic-Tac-Toe Number line Pebbles in the bag	Postman stories Addition, Sub- traction & Multiplication	Quadratic equations	Guess the function Pattern game	Graph □ + △ = 9
#57	Tic-Tac-Toe Number line Pebbles in the bag	Postman stories Addition & Subtraction Guess the function	Postman stories Multiplication Quadratic equations	Film and rods	Graphing and variations of Tic-Tac-Toe

	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10
Dist. #25	More graphing	Geoboards & Graphing	Shoeboxes & Paper folding	Tinfoil 5 sq. geometry	Mop up
#54	Graphing 3 x □ + 4 = △	Geoboards	Graphing Geoboard area	Tinfoil 5 sq. geometry	Paper folding Shoeboxes
#57	Graphing Introduction to Geoboards	Graphing Geoboard area	Tinfoil geometry 5 sq. geometry Paper folding	Shoeboxes Pattern game	Mop up

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9:00	P.I.B. #	Guess the function Open sentences Quadratic equations	Easy graphing	Geoboards & Graphing	Shoe boxes
	Break				
10:00	Trio, leveling, trio	NASA Moon Game	Mem Haar Hoolim	ESS & l.c. kids	Gattegno Film
	Coffee Break				
11:00	Micro-teach				
11:30	Critique				
12:00	Lunch				
1:00	Postman +, -, x	Finite differences	Harder graphing	Tin foil geometry	Bring in other games
	Break				
2:00	Micro-teach				
2:30	Critique				

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9:00	P.I.B. #	Postman Even and odds	Guess the function Even and odds	Ideal School Conference	Graphing
10:15	Trio, leveling, trio	SRA	NASA	" "	Micro-teaching J.L.
1:00- 3:00	Kids & Critique	Kids & Critique	Kids & Critique	Kids & Critique	Kids & Critique
3:00- 4:00	Real math	Math	2:45 Baughman	Content Rules for "Guess the Function"	
9:00	Graphing & Geoboards	Graphing & Geoboards	Xerox listening material	5 square geometry	Lab - shoeboxes
10:20	Adult Simulation	Tinker toys for motivation	Xerox listening material	Plans for own workshop	Puzzling Gattegno film Evaluation
1:00- 3:00	Kids & Critique	Kids & Critique	Kids & Critique	Kids & Critique	Luncheon
3:00- 4:00	Use of In-service package	Use of In-service package	Use of In-service package		

APPENDIX C

Evaluation Instruments

NAME _____ DATE _____

POSITION _____

Please indicate how you feel about the effectiveness of the following parts of your visit to the Madison Project Math Program:

1. Orientation

2. Envolvement (opportunity to work with the shoe boxes)

3. Classroom visitation

4. De-briefing session

In order to get some feeling for what are the most valuable type of Madison Project experiences for teachers, we need some data on the use of these materials in classes. Would you please fill out the following questionnaire and return it to me? Thank you.

Please check the appropriate columns. You may want to put in more than one check.	I found this very effective and exciting	I found this effective but not particularly exciting	I had trouble getting this over to the kids	I have not tried this	I will not try this because it is the wrong grade level for the children	I will not try this because I don't like it
Tic-tac-toe						
Pebbles in the Bag						
Postman Stories						
Guess the Function						
Graphing □ + △ = No.						
Graphing Kx □ + M = △						
Geo-boards						
Shoeboxes						

Any anecdotes or comments you think may be useful

the Elk Grove Training and Development Center

1706 West Algonquin Rd., Arlington Heights, Ill. 60005 (312) 259-8050

Recently we had the pleasure of meeting you and demonstrating for you the Madison Project Mathematics materials. As we discussed during your visit, the coordinator of the Madison Project model program is available to offer consultant services for this program. We are interested to know if we can be of any further help to you.

In order to ascertain our effectiveness as a demonstration program, we need to have some information from you. Would you be kind enough to fill out this information sheet and return it to us.

Thank you.

Sincerely yours,

Doris Machtinger

Doris Machtinger,
Madison Math Coordinator

DM/ce
Encl.

E L K G R O V E T R A I N I N G & D E V E L O P M E N T C E N T E R

Madison Project

1. Did you use any of the methods and/or materials presented in the Madison Project demonstration <u>before</u> you saw the demonstration?

   Methods: Yes _____ No _____ Not sure _____

   Materials: Yes _____ No _____ Not sure _____

   If yes, which ones?_____

   _____

2. Have you talked to any of the following persons about your visit to the Madison Project demonstration and the things (methods, materials, ideas) you saw and heard? *(Check those persons you talked with)*

   _____ principal _____ superintendent _____ school board member

   _____ teacher _____ curriculum coordinator

   _____ other *(Please specify)* _____

   _____

   _____ have not talked to anyone

3. Have you <u>started</u> to use (are you <u>using</u>) any of the ideas and/or materials presented by the Madison Project demonstration?

   Ideas: Yes _____ No _____

   Materials: Yes _____ No _____

   If yes, which ones?_____

   _____

4. Do you <u>plan</u> to use any of the ideas and/or materials presented by the Madison Project demonstration?

   Ideas: Yes _____ No _____ Not sure _____

   Materials: Yes _____ No _____ Not sure _____

   If yes, which ones? _____

   _____

5. Would you like to consult with the Coordinator to help you implement and/or discuss the program?

   Discussion: Yes _____ No _____ Will let you know _____

   Implementation: Yes _____ No _____ Will let you know _____

6. Do you feel your ideas about teaching and methods of teaching have been changed as a result of visiting the Madison Project demonstration?

   Ideas: Definitely changed 1 2 3 4 Definitely NOT changed

   Methods: Definitely changed 1 2 3 4 Definitely NOT changed

   Materials: Definitely changed 1 2 3 4 Definitely NOT changed

7. Comments (suggestions, criticism, etc.) and/or questions you have concerning the Madison Project program?

DM/ce
11/28/67

Name_____

School_____

District_____ Grade_____

Workshop
Leader's Name_____

MADISON PROJECT MATH CONTENT QUESTIONNAIRE

DIRECTIONS: Please check the appropriate columns.

	I can do this myself	I know about it but I can't do it myself	I don't know what you mean by this	I know it well enough to teach it
Plotting points on a graph				
Addition & subtraction of signed numbers				
Multiplication of signed numbers				
Write an equation from given data (what's my rule?)				
Quadratic Equations				
Graph of equations like $\square + \Delta = 7$				
Graph equations like $3 \times \square + 4 = \Delta$				

E L K G R O V E T R A I N I N G & D E V E L O P M E N T C E N T E R

MADISON PROJECT EVALUATION SHEETS

Name _____

Grade you teach _____

School _____ District _____

Workshop leader _____

Length of workshop _____

Dates of workshop _____

DM/ce - 9/30/68

CHECK THE APPROPRIATE COLUMNS FOR THE FOLLOWING MADISON PROJECT LESSONS

	I can do	I cannot do	I will do	I will not do	I like	I do not like	Comments
Pebbles in the bag							
Postman stories							
Graphing lesson □ + △ = 12							
Guess the function							
Quadratic equation lesson							
Area with geoboards							
Area equation on graph							
5 square geometry							
Tin foil geometry							
Graphing lesson 3x □ + 1 = △							

If kids were available for testing the new materials, please comment on how you felt initially and how you feel now about this experience:

General comments about this workshop:

E L K G R O V E T R A I N I N G & D E V E L O P M E N T C E N T E R

Madison Project Math

BOUQUETS

BRICKBATS

MADISON PROJECT MATH WORKSHOP

1. I believe this about students' ability to perform in math:

2. I believe this about students' attitudes toward math:

3. I believe this about the best classroom climate for teaching math:

4. I believe this about the best kind of grouping for teaching math:

5. I believe parents feel like this about modern math:

6. I feel like this about modern math:

DM/ce - 10/1/68

the Elk Grove Training and Development Center

1706 West Algonquin Rd., Arlington Heights, Ill. 60005 (312) 259-8050

December 18, 1968

Dear Madison Project
Workshop Participant:

The Elk Grove Training and Development Center is trying to put together a comprehensive evaluation report of the effectiveness of its programs.

We very badly need your cooperation in our effort to help supply what data we can. Please help us by filling out the enclosed questionnaire and returning it immediately.

Thank you.

Sincerely yours,

Doris Machtinger

Doris Machtinger, Coordinator
Madison Project Math

DM/ce
Encl.

CHECK THE APPROPRIATE SPACES

1.

	I have used	I have not used but intend to do so	I have not used and do not intend to do so because:			
			the grade level is inappropriate	I don't like the lesson	the materials are unavailable	other
Pebbles in the bag						
Postman stories						
Tic-tac-toe						
Graphing lesson □+△ = 12						
Graphing lesson 3x □+ 1 =△						
Guess the function						
Quadratic equation lesson						
Area with geoboards						
Area equation on graph						
Tin Foil geometry						

CHECK THE APPROPRIATE SPACES

11.

	In my opinion most of the students understood these activities:				
	very well	well	poorly	very poorly	I did not use this
Pebbles in the bag					
Postman stories					
Tic-tac-toe					
Graphing lesson $\square + \Delta = 12$					
Graphing lesson $3 \times \square + 1 = \Delta$					
Guess the function					
Quadratic equation lesson					
Area with geoboards					
Area equation on graph					
Tin foil geometry					

CHECK THE APPROPRIATE SPACES

III.

	How do you feel about your ability to use these activities with children?			
	very confident	confident	insecure	very insecure
Pebbles in the bag				
Postman stories				
Tic-tac-toe				
Graphing lesson $\square + \triangle = 12$				
Graphing lesson $3 \times \square + 1 = \triangle$				
Guess the function				
Quadratic equation lesson				
Area with geoboards				
Area equation on graph				
Tin foil geometry				

IV. I am aware of other teachers in my building who have not attended a Madison Project Math workshop who want to use Madison Project Math.

_____ Yes _____ No

V. I have talked to teachers responsible for teaching mathematics in schools other than my own about Madison Project Math.

_____ Yes _____ No

VI. Please check those materials your school has purchased specifically for Madison Project Math activities:

_____ Geoboards

_____ Peg games

_____ Shoe boxes

_____ Teacher's edition of Discovery Test

_____ Teacher's edition of Exploration Test

_____ Student's edition of Discovery Test

_____ Student's edition of Exploration Test

_____ Other games commercially available seen at Madison Project workshop.

VII. Briefly comment on the reaction of the children to the Madison Project Math

VIII. Was your math background sufficient to enable you to participate effectively in the workshop?

_____ Yes Comment:

_____ No

IX. I feel the Madison Project Math workshop was:

_____ Highly beneficial _____ Of little value

_____ Beneficial _____ Of no value

X. School _____

Level I teach _____

Name _____

Date of workshop attended _____

MADISON PROJECT MATH

Follow-Up Questionnaire

In an effort to continually examine our Madison Project Math program we are asking those teachers who have participated in the workshops to provide us with current information.

It is our belief that such information obtained after you have had an opportunity to return to your classroom and try some of the activities will be most helpful to our on-going evaluation.

Please provide the information requested and return the questionnaire in the self-addressed envelope by

Many thanks for your help in this matter!

Sincerely,

Doris Machtinger, Coordinator
Madison Project Math

DM/ce
Encl.

APPENDIX D

Consultants to the Program

DIRECTORY OF CONSULTANTS

John Holt

Neil Postman

Judith Lowe

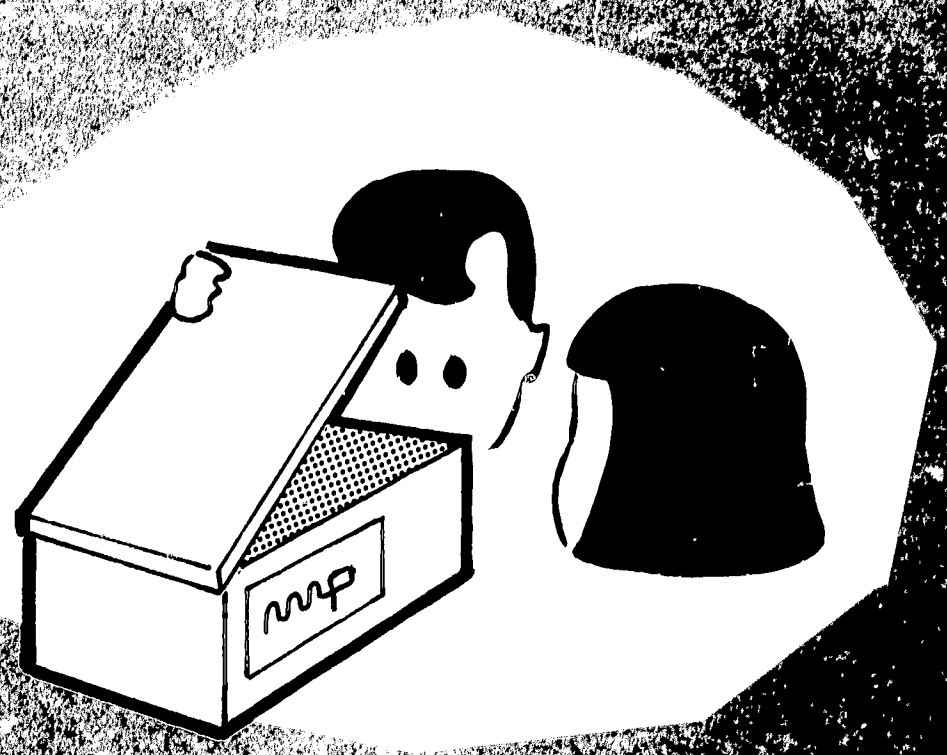
Gerald Baughman

Robert B. Davis

APPENDIX E

Relevant Materials

Big ideas for little people



The Elk Grove Training and Development Center

1706 West Algonquin Rd., Arlington Heights, Ill. 60005

The Elk Grove Training and Development Center has been organized to help meet the demand that Education keep pace with mushrooming mass of new information, scientific discovery, and innovation in methods and techniques. Members of the Center consotorium include public, private, and parochial schools, colleges and universities, and the cooperative Educational Research Laboratory, Inc.

Funded under Title III of the Elementary and Secondary Education Act.

Phone AREA CODE 312/259-8050

FOR INFORMATION OR AN APPOINTMENT

"WE DON'T 'MAKE' STUD
WE ASSIST CHILDREN
STRUGGLE TO BECOME

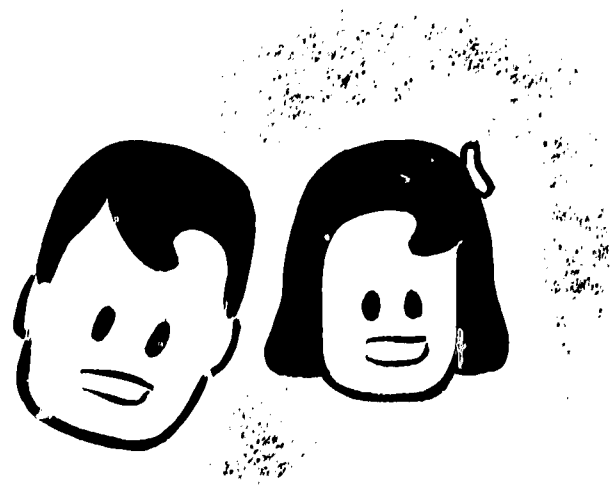
Tc touch, to manipulate materials in a laboratory at This is the heart of Madison Project Mathematics that introduces children to the wide spectrum of soph concepts. Directed by Dr. Robert B. Davis of Syracuse College, the Madison Project is an exciting supplem velopment project outstanding in its approach to in and to the discovery method of learning.

The materials used by the Madison Project are de range of the daily mathematics curriculum. By care and by increasing the vitality and relevance of th with mathematics, Madison Project stimulates stu mathematical environment.

Self exploration materials, and classroom discuss

MADI
math

AKE' STUDENTS, NOR 'SHAPE' THEM;
HILDREN IN THEIR SELF INITIATED
BECOME MATURE ADULTS. — Dr. R.B. Davis



als in a laboratory atmosphere, to discover! Project Mathematics — a unique approach wide spectrum of sophisticated mathematical t B. Davis of Syracuse University and Webster s an exciting supplementary curriculum de- in its approach to independent exploration earning.

dison Project are designed to broaden the curriculum. By careful readiness building, and relevance of the students' experience oject stimulates students to explore their

d classroom discussion materials are two staples of the Madison Project. Simple, but clever in concept, the self-exploration materials are housed in an attractively decorated shoe box — a delight to both students and teacher, yet complete in their mathematical accuracy. Alone, or in small groups, students enjoy playing with the mathematics materials, following direction cards or inventing and carrying out their own mathematics projects.

Classroom discussions build on actual experiences. It is impossible to suppress young minds as they seek to test and compare newly discovered mathematical vistas.

In the world of mathematics, the big idea for little people is the Madison Project. You're invited to contact the program's coordinator, Doris Machtinger, at the Elk Grove Training and Development Center. Phone (area code 312) 259-8050 for information or an appointment concerning demonstrations.

DISON PROJECT
thematics mnp

E L K G R O V E T R A I N I N G & D E V E L O P M E N T C E N T E R

MADISON PROJECT

The Madison Project is a supplementary mathematics program. It has been directed by Dr. Robert B. Davis of Syracuse University and Webster College and has been funded mainly by the U.S. Office of Education, with additional funds from a long list of subscribers.

The project started in the Madison Junior High School in Syracuse, New York as an attempt to solve the problem of weak skills and lack of sympathy for a "mathematical" approach in college freshmen. Soon after it began, the program moved down into the elementary school, since, after all, that is where the work really begins.

The Madison Project tries to keep the materials of a nature that is refreshing to both teacher and student, while maintaining mathematical accuracy. The teaching approach nurtured in the very form of the materials is one of respect for the student as a person with ideas worth cultivating. The materials fall, basically, into two categories, self-exploratory materials and classroom discussion materials.

The self-exploration materials consist of a set of apparatus and some direction cards, housed in a shoe box, attractively colored blue. Students enjoy playing with the materials, alone or in small groups, following the direction cards or inventing their own tasks. The materials are ideal for learning center materials, math-lab materials and, of course, material for the activity shelf in a self-contained classroom.

The classroom materials again can be roughly broken into two categories. While Madison Project materials do not teach children their basic skills, they do provide the children with some tools that they generally do not have at their disposal, e.g., working with negative numbers. Some of the Madison Project lessons are designed to teach children these tools. These tools are usually taught through the use of games, games as common as tic-tac-toe.

Once the tools are mastered, the really exciting lessons can follow. These lessons are concerned with allowing the children to use their new tools, to explore their power, to test out their mathematical environment. These lessons are especially conducive to discovery teaching.

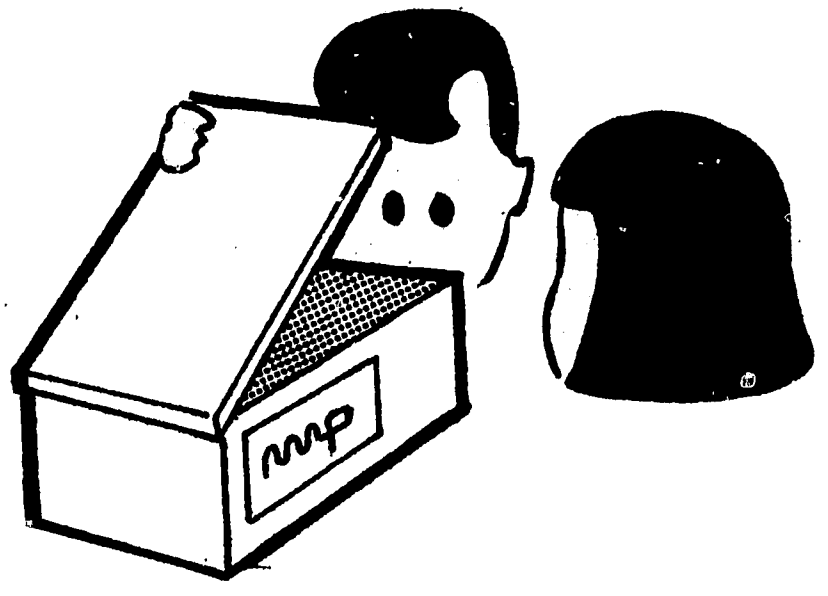
The Elk Grove Training & Development Center is sponsoring a model program of the Madison Project materials for the third year. The materials are being demonstrated by Miss Micky Palac at Fairview School in Schaumburg School District #54, Mr. Wayne E. Schaible, Superintendent; Mr. Marvin Johnson, Principal. The program is coordinated by Mrs. Doris Machtinger.

The T & D Center is interested in helping interested schools adopt any part of this program to fit their needs. If you are interested, contact Mrs. Doris Machtinger at the T & D Center, phone 259-8050

DM/ce
9/11/68

MADISON PROJECT

MATERIALS



Independent Exploration Material --

Shoe boxes with instruction cards and materials. Set of 6 includes:

Geoboard & Workcards
Tower Puzzle & Workcards
Centimeter Blocks & Workcards
Discs & Workcards
Weights, Springs & Workcards
Peg Game & Workcards

1 set of 6 - - - - - - $16.25
4 sets of 6 ea. - - - 15.00 ea.

Order from: Math Media Division
N & M Associates
P.O. Box 1107
Danbury, Conn. 06810

- -

Discovery in Mathematics - - by Dr. R.B. Davis

Teacher's Edition - - - - $6.00
Student's Edition - - - - 2.50

Exploration in Mathematics - - by Dr. R.B. Davis

Teacher's Edition - - - - $6.00
Student's Edition - - - - 2.50

Order from: Addison-Wesley Pub. Co., Inc.
106 W. Station
Barrington, Ill. 60010
or
South St.
Reading, Mass. 01867

Centimeter Rods - -

Colored Centimeter Rods (Kit of 19 rods)

[illegible]-1413 - - - - - - - - - - - - $1.20 ea.
Add 8% for handling charges
Add State and Local taxes where they apply

Order from: Houghton Mifflin Company
1900 S. Batavia Ave.
Geneva, Ill. 60134

- -

In Service Package - -

In-Service Package - - - - - - - $3.00 ea.

Order from: Madison Project
c/o Webster College
Webster Groves, Mo. 63119

MATERIALS USED IN

THE TRAINING PROGRAM

Xerox Effective Listening Kit	Xerox Corporation 600 Madison Ave. New York, N.Y. 10022
S.R.A. Teaching Problems Lab	Science Research Assoc., Inc. 259 E. Erie St. Chicago, Ill. 60611
Leveling: A Method For Communicating Significant Personal Information	R.B. Morton
NASA Moon Game	
Tinker Toy Motivation Game	
Process Observation Trio	
Especially designed tapes illustrative of adult workshop problems	

DECISION MAKING EXERCISE

INSTRUCTIONS: You are a member of a space crew originally scheduled to rendezvous with a mother ship on the lighted surface of the moon. Due to mechanical difficulties, however, your ship was forced to land at a spot some 200 miles from the rendezvous point. During re-entry and landing much of the equipment aboard was damaged and, since survival depends on reaching the mother ship, the most critical items available must be chosen for the 200 mile trip. Below are listed the 15 items left intact and undamaged after landing. Your task is to rank order them in terms of their importance for your crew in allowing them to reach the rendezvous point. Place number 1 by the most important item, the number 2 by the second most important, and so on through number 15, the least important.

___ Box of matches

___ Food concentrate

___ 50 feet of nylon rope

___ Parachute silk

___ Portable heating unit

___ Two .45 calibre pistols

___ One case dehydrated Pet milk

___ Two 100 lb. tanks of oxygen

___ Steller map (of the moon's constellation)

___ Life raft

___ Magnetic compass

___ 5 gallons of water

___ Signal flares

___ First aid kit containing injection needles

___ Solar-powered FM receiver-transmitter

SUPERINTENDENT'S
OFFICE
LAwrence 9-1806-07-09

Community Consolidated School District 54
SCHAUMBURG TOWNSHIP, COOK COUNTY
P.O. ROSELLE, ILLINOIS

BLACKHAWK SCHOOL
Illinois Blvd. & Schaumburg Road
Hoffman Estates, Illinois 60172

April 1, 1968

Mrs. Dory Machtinger
Elk Grove Training & Developmental Center
1706 W. Algonquin
Rolling Meadows, Illinois

Dear Dory:

I would like to share with you my observations of the four people that we sent to your Madison Math Workshop in March. I had a meeting with them last week to discuss ideas that they might have concerning the summer workshop. I was impressed not only with their opinion of the Madison materials but also with their attitudes. You could sense that these people had worked constructively together and were also able to critize and discuss each others suggestions without any offense being taken. Whatever there exposure in your workshop was, you certainly conveyed to these people a sense of unity and purpose. These traits will make them better persons, as well as better teachers. Thank you for your efforts and help.

Sincerely,

R. J. Cizek, Principal
Blackhawk & Twinbrook
Schools

RJC:dn